Amendments to the Drawings

The attached sheet of drawings includes changes to Figs. 1 and 3. Fig. 1 is amended by adding referenced 22 and 27, and Fig. 3 is amended by adding references 64a and 64b to the displacement actuator 64. Annotated sheets in which the changes have been circled and replacement sheets are attached.

REMARKS/ARGUMENTS

A question was raised as to whether applicant was claiming priority to U.K. application No. 021604.8. Applicant is claiming priority to U.K. application No. 0216204.8 as set forth in the preliminary amendment and the Application Data Sheet. There was an error in the filing receipt in identifying the priority application as 021604.8. A request for a corrected filing receipt was mailed on December 13, 2005. The priority document was filed in the parent PCT application on August 8, 2003.

The 4th paragraph on page 6 of the specification has been amended to correct reference "26" to --27--.

In amended Fig. 1, the previously omitted element numerals 22 and 27 have been added and in amended Fig. 3 the omitted reference numerals 64a and 64b have been added. The objection also asserted that the reference numeral 64 was not shown on the drawings. This reference was shown in the upper left portion of Fig. 3 as filed.

Claims 1, 4-9, 12, 13, 16-18, 23 and 25 remain in this application unchanged.

The subject matter of the various claims was commonly owned by the assignee of the application at the time the inventions covered therein were made.

Applicants respectfully traverse the rejection of claims 1, 4-9, 12, 13, 16-21, 23 and 25 under 35 U.S.C. §103(a) as being unpatentable over Pugh patent 4,042,135 in view of Bach et al. patent 5,257,177. It is respectfully submitted that neither Pugh nor Bach et al. recognize the problem nor suggest a solution covered by applicants' claimed invention. Pugh is directed to sensing when a vehicle such as a forklift is overloaded or moves a load towards a position which is unstable. When the vehicle stability exceeds a predetermined level, either an audible or visual alarm is activated or the vehicle is prevented from further movement towards the unstable position which could cause the vehicle to overturn. Pugh stated at column 3, lines 20-24: "The signal from the strain gauges is taken to an alarm system and/or to a dial diving a visual warning. The signal would also actuate the control valves stopping any further motion of the telescopic boom by the ram 15."

Bach et al. is directed to a path control for a hydraulically operated machine such as a forklift, an excavating shovel or a hoist. A controller operated a number of valves to cause actuators to move a tool along a desired path. The referenced language at column 11, lines 1-14 does not appear to be relevant to applicants' invention. Bach et al. only relates to path control and has nothing to do with maintaining stability of the machine.

Applicants' claimed invention is an improvement over the prior art such as Pugh. Pugh only recognized when an unstable position is being approached and gives the operator an alarm and/or stops further movement of the machine. If the machine is too close to an unstable position and the load has sufficient momentum, quickly stopping further movement can cause the machine to overturn. Pugh does not recognize or address this possibility.

Applicants' claimed invention differs from Pugh in that it senses when an unstable position is approached, and slows down but does not stop movement of the load to avoid becoming unstable due to the momentum of the moving load. Typically, to avoid the abrupt arresting of the movement of a machine arm form tipping the machine as taught by Pugh, it is necessary to ensure that the control valves are closed way ahead of when they might really need to be closed.

The office action suggests that it would be obvious to replace the Pugh mechanism with proportional valves of Bach et al. in order to achieve progressively slow lowering. Neither Pugh nor Bach et al. recognize the problem or suggests a solution to the problem. A combination of Pugh and Bach et al. as suggested will only produce a machine which has the Bach et al. path control and the Pugh alarm and means for abruptly stopping further movement along the path when a predetermined unstable position is reached. There is nothing in either reference which will cause the speed that a load is moved to automatically decrease as movement of the load approaches a position where the machine is unstable and at risk of tipping. There is no teaching in either reference of a sophisticated system for controlling movement of

a load which can be used to progressively slow the rate of movement of an arm as an unstable position is approached.

Independent claims 1, 23 and 25 specifically require a sensor to sense when the value of the tipping moment is approaching a threshold value, and a controller which is responsive to the sensed value to reduce the flow of fluid to the actuator so that the speed of movement of the load is progressively reduced as the lifting arm is continued to be lowered. Neither Pugh nor Bach et al. has such a controller. Consequently, claim 1 and dependent claims 1, 4-9, 12, 13, and 16-18 are patentable over Pugh and Bach et al. Without such a teaching and in view of the fact that neither reference recognize that the load can still be safely moved at a slower rate as the machine approaches an unstable position, it is submitted that the claims are patentable over Pugh and Bach et al. and that the rejection should be withdrawn.

Applicants respectfully traverse the rejection of claims 19 and 20 under 35 U.S.C. §103(a) as being unpatentable over the Pugh patent in view of the Bach et al. patent and Meyer et al. patent 4,822,237. Claims 19 and 20 are dependent on claim 1 and are patentable over Pugh and Bach et al. for the reasons discussed above. Meyer et al. has no disclosure relating to sensing the load moment on a machine having load handling apparatus or for responding to the sensed load moment for slowing down movement of the load. Consequently, claims 19 and 20 are patentable over Pugh, Bach et al. and Meyer et al. and the rejection should be withdrawn.

Applicants respectfully traverse the rejection of claims 21 under 35 U.S.C. §103(a) as being unpatentable over the Pugh patent in view of the Bach et al. patent and Wacht et al. patent 5,058,752. Claim 21 is dependent on claim 1 and is patentable over Pugh and Bach et al. for the reasons discussed above. Wacht et al. is similar to Pugh in that it teaches sensing the moment on a load lifting boom and generating an alarm or warning when the moment when a predetermined moment is exceeded. However, Wacht et al. does not cure the failure of Pugh and Bach et al. to suggest using the moment for slowing down movement of the load as an unstable load

position is approached. Consequently, claims 21 also is patentable and the rejection should be withdrawn.

The Pugh and Wacht et al. systems either generate an alarm or warning or, for Pugh, stop movement of the load when the load is in a region approaching an unstable position where the machine is at risk of tipping. If an alarm or warning is generated in this region, the operator may still continue to move the load at full speed with the risk of the machine tipping, especially if a heavy load is abruptly stopped. If movement is stopped as with one feature in Pugh, then the region in which the machine can be operated is limited. Applicants' invention differs from both Pugh and Wacht et al. in that it allows safe movement of a load in a region approaching the stability limit but only at lower speeds which extend the safe operating range. None of the references recognize that if the speed at which a load can be moved is limited in the range approaching instability, then the machine can safely operated in a range closer to the point of instability.

Please extend the time for responding to the office action to the mailing date of this response. A Petition For Extension Of Time is enclosed charging the extension fee to the deposit account of MacMillan, Sobanski & Todd, LLC.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

By Oliver E. Todd

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Enclosures

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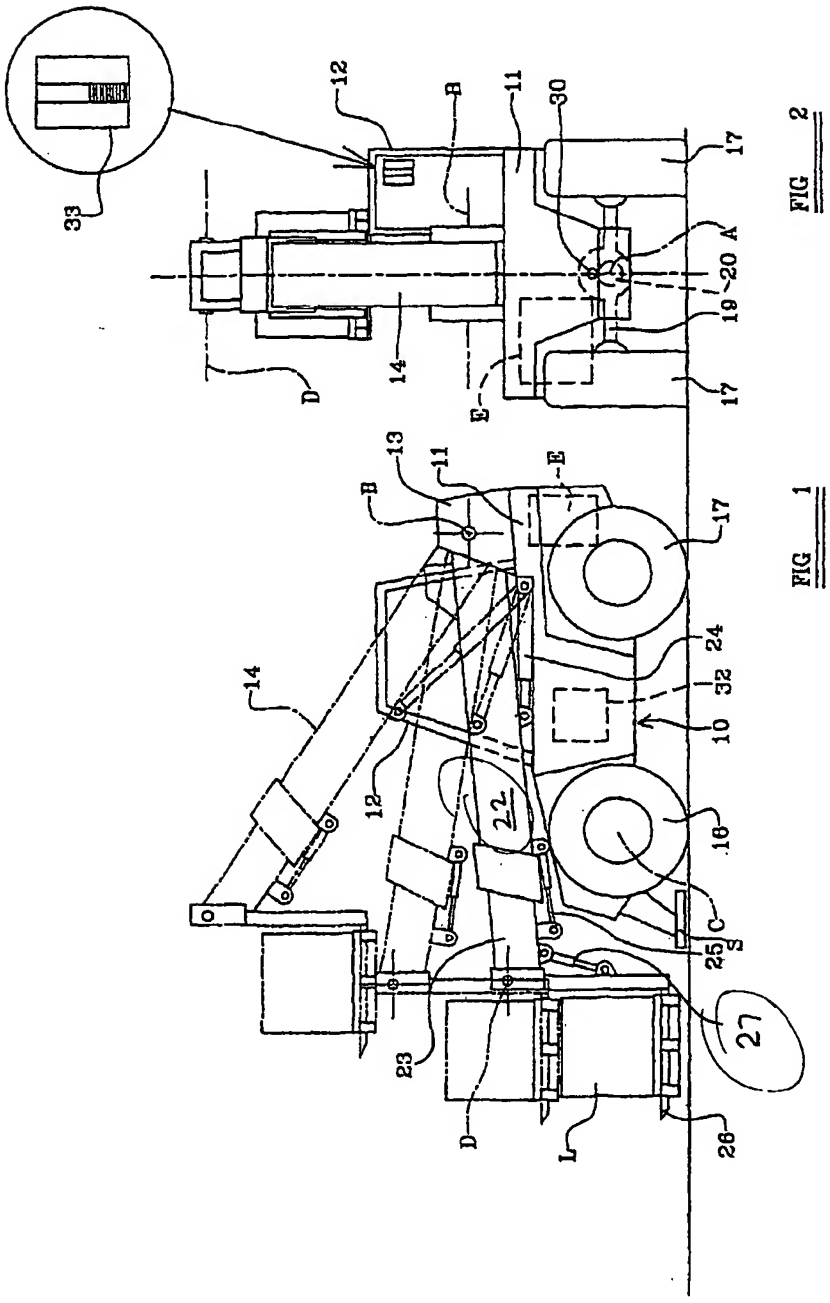
Annotated Sheet Showing Changes



Annotated Sheet Showing Changes

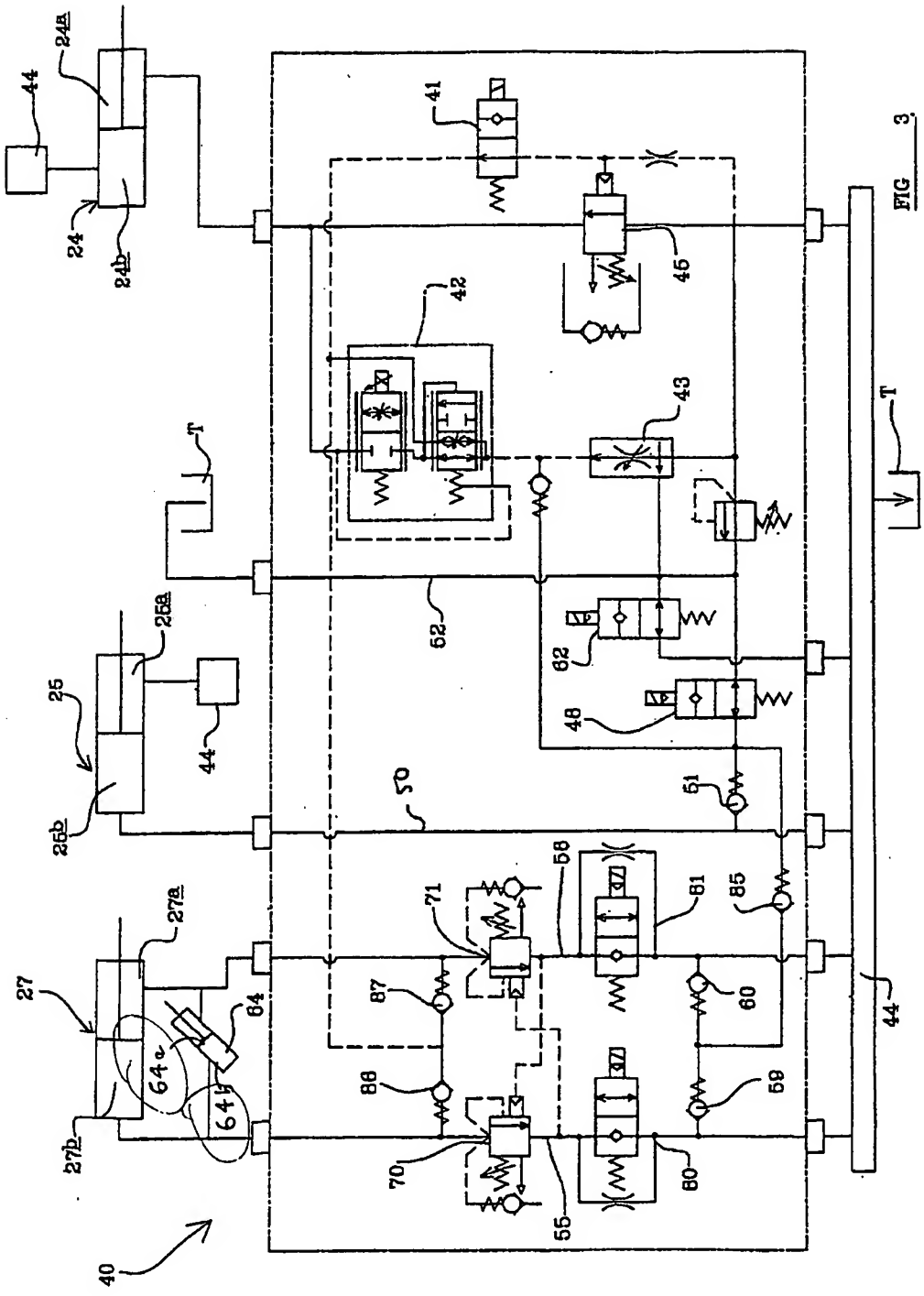


FIG 3